

THAT WHICH IS CLAIMED:

1. An apparatus for recycling slurry used with an edge-notch polishing apparatus, comprising:

a dirty slurry return conduit;

a first screen filter in fluid communication with said dirty slurry return conduit,

5 for removing particulates larger than a first predetermined size from the slurry;

a dirty slurry storage tank downstream of said first screen filter;

a second filter located downstream of said dirty slurry storage tank for removing particulates larger than a second predetermined size from the slurry, wherein the second predetermined size is smaller than the first predetermined size such that the second filter  
10 removes smaller particulates than the first filter;

a clean slurry storage tank located downstream of said second filter; and,

a clean slurry supply conduit leading from said clean slurry supply tank.

2. The apparatus for recycling slurry of claim 1, further comprising:

15 a slurry pump located between said dirty slurry storage tank and said second filter.

3. The apparatus for recycling slurry of claim 2, wherein the slurry pump provides increased slurry pressure of at least 5 pounds per square inch.

20 4. The apparatus for recycling slurry of claim 3, wherein the slurry pump provides a slurry flow rate of between about 0.4 and 2.0 liters per minute.

5. The apparatus for recycling slurry of claim 1, further comprising:  
an overflow relief conduit which directs overflow from the clean slurry storage tank into  
25 the dirty slurry storage tank.

6. The apparatus for recycling slurry of claim 5, further comprising an overflow drain disposed within the dirty slurry supply vessel, whereby the overflow drain

prevents accumulated slurry in the dirty slurry storage tank from backflowing through the overflow relief conduit.

5           7.       The apparatus for recycling slurry of claim 5, wherein the clean slurry storage tank and the dirty slurry storage tank are portions of a single vessel separated by a partition, wherein the top edge of the partition acts as the overflow relief conduit.

10           8.       The apparatus for recycling slurry of claim 1, wherein said second filter is removable.

15           9.       The apparatus for recycling slurry of claim 8, further comprising a first valve located between the pump and the second filter, and a second valve located between the second filter and the clean slurry storage tank, whereby the removable second filter may be temporarily isolated by closing the first and second valves.

20           10.      The apparatus for recycling slurry of claim 1, further comprising at least one device selected from the group consisting of pH adjusters, slurry concentration adjusters, deionization units, and combinations thereof.

25           11.      The apparatus for recycling slurry of claim 1, wherein said first filter removes particulates of at least 0.2 mm.

30           12.      The apparatus for recycling slurry of claim 1, wherein said first filter removes particulates of at least 0.4 mm.

          13.      The apparatus for recycling slurry of claim 1, wherein said second filter removes particulates of at least 10  $\mu$ m.

          14.      The apparatus for recycling slurry of claim 1, wherein said second filter removes particulates of at least 20  $\mu$ m.

15. The apparatus for recycling slurry of claim 1, further comprising an additional filter, valves at the inlet and outlet of the additional filter, and valves at the inlet and outlet of the second filter, wherein said additional filter resides in parallel to said second filter, and wherein said additional filter also removes particulates of a second predetermined size.

16. A slurry recycling apparatus, comprising:  
a first screen filter for removing particulates larger than about 0.4 mm from the slurry;  
a dirty slurry storage tank downstream of said first screen filter for containing the slurry filtrate of the first filter;  
a slurry pump downstream of said dirty slurry storage tank which provides slurry flow of at least 0.4 liters per minute at a pressure of at least 5 psi;  
a second filter located downstream of said dirty slurry storage tank for removing particulates larger than about 20  $\mu\text{m}$  from the slurry;  
a clean slurry storage tank located downstream of said second filter for containing slurry filtrate of the second filter;  
an overflow conduit for conducting overflow slurry from the clean slurry storage tank to the dirty slurry storage tank; and  
a clean slurry supply conduit leading from said clean slurry supply tank for supplying slurry to the edge-notch polishing apparatus.

17. A process for recycling slurry used with an edge-notch polishing (ENP) apparatus, said process comprising the steps of:  
providing recycled slurry from an ENP operation;  
filtering said slurry through a first filter and removing particulates larger than a first predetermined size from the slurry;  
storing the first slurry filtrate in a dirty slurry storage tank;  
filtering said slurry through a secondary filter and removing particulates larger than a second predetermined size from the slurry, wherein the second predetermined size

is smaller than the first predetermined size such that the second filter removes smaller particulates than the first filter;

storing said second slurry filtrate in a clean slurry storage tank; and,  
releasing slurry from the clean slurry storage tank.

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18. The process of recycling slurry as in claim 17, further comprising  
pumping the slurry from the dirty to the clean slurry storage tank.

19. The process of recycling slurry as in claim 18, further comprising  
10 directing slurry overflow from the clean tank to the dirty tank.

20. The process of recycling slurry as in claim 18, wherein  
providing a constant overflow of slurry from the clean tank into the dirty tank.

21. The process of recycling slurry as in claim 17, further comprising  
15 regularly removing and cleaning said secondary filter.

22. The process of recycling slurry as in claim 21, wherein the step of  
regularly removing and cleaning said second filter comprises:

20 reducing the output of the slurry pump, whereby slurry is accumulated in said  
dirty tank;

isolating the second filter from the slurry pump and the clean tank, whereby the  
ENP is supplied with stored slurry from the clean tank;

servicing said second filter;

25 bringing the filter back in-line with the slurry pump and the clean tank; and  
restoring the output of the slurry pump.

23. The process of recycling slurry as in claim 21, wherein the step of  
regularly removing and cleaning said secondary filter comprises the steps of alternately  
30 directing slurry flow through one secondary filter or an additional secondary filter

residing in parallel with the first secondary filter, and removing or cleaning the filter through which no slurry is flowing.

5           24.     The process of recycling slurry as in claim 17, wherein the filtering of the slurry through the first filter involves removing particulates larger than about 0.2 mm from the slurry.

10           25.     The process of recycling slurry as in claim 24, wherein the filtering of the slurry through the first filter involves removing particulates larger than about 0.4 mm from the slurry.

15           26.     The process of recycling slurry as in claim 17, wherein the filtering of the slurry through a second filter involves removing particulates larger than about 10  $\mu$ m from the slurry.

20           27.     The process of recycling slurry as in claim 26, wherein the filtering of the slurry through a second filter involves removing particulates larger than about 20  $\mu$ m from the slurry.